

EXTRACTION OF METALS WITH DIQUATERNARY AMMONIUM SALTS

ABSTRACT OF THE DISCLOSURE

Selective extraction of a metal anion complex, such as a platinum-group metal halide, from an aqueous solution containing other metal anions or anion complexes, by contacting the solution with a diquaternary ammonium salt having two quaternary nitrogens spaced at a distance less than about 10 Å, selectively binding the metal anion complex to the diquaternary ammonium salt to form an organo-metallic complex, and separating the organo-metallic complex from the solution. Alternatively, the diquaternary ammonium salts may be adsorbed or chemically bonded to a substrate, and the metal anion complex-containing solution passed over the substrate. Preferably, the two quaternary nitrogens are spaced a distance apart that is complementary to the ionic diameter of the target metal anion complex. Typically, the platinum group metal halide anion complexes have a valence of -2 and each of the two quaternary nitrogens of the diquaternary ammonium salt have a valence of +1, such that the organo-metallic complex formed is a stable pair.